

**A NEW SPECIES OF FOSSIL *DASYMUTILLA*
(HYMENOPTERA: MUTILLIDAE) FROM
DOMINICAN AMBER**

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Abstract.—*Dasymutilla dominica*, a new species of mutillid wasp, is described from a fossil specimen embedded in a piece of Dominican amber estimated to be from 25 to 40 million years old. Very few fossil mutillids have been recorded, and this represents the first description of a fossil mutillid from the New World. This male belongs to the *bioculata* species-group, and can be distinguished from closely related species by its totally black integument.

Key Words.—Insecta, *Dasymutilla dominica*, Mutillidae, new species, fossil, Dominican amber

Fossil velvet ants, or mutillids, are extremely rare and thus far have been limited to Palaearctic forms. Menge (1856) mentioned finding six specimens of this family in Baltic amber and Brischke (1886) cites another three in the same deposits. In addition, Larsson (1978) mentions an additional three in the Copenhagen collection of Baltic amber insects. To our knowledge, none of the above have been described. Scudder (1891) also makes reference to an undescribed *Mutilla* from the mid-Oligocene beds (not amber) located in Brunstatt, Alsatia (now Alsace), in northeastern France.

Bischoff (1915) described seven species of fossil mutillids from Baltic amber, placing them in a new genus, *Protomutilla*. Although Krombein (1979) suggests that at least one of those species may not be correctly assigned to the family Mutillidae, that does, nevertheless, appear to be the first description of a fossil mutillid.

Sharov (1957) described another new species of aculeate Hymenoptera from the Cretaceous of Siberia, which was ultimately assigned to Mutillidae. That fossil specimen, estimated to be about 80 million years old, was called *Cretavus sibiricus* Sharov, for which the author created a new family, Cretavidae. However, Rasnitsyn (1975) determined that the specimen was justified in being placed in the family Mutillidae.

We describe here a mutillid from a piece of Dominican Republic amber. This represents the first record and description of a fossil mutillid from the New World.

METHODS AND MATERIALS

The piece of amber containing the mutillid was lent to GOP for study by Aldo and Didi Costa of Puerto Plata, Dominican Republic. The original piece had to be reshaped in order to better obtain a closer examination of the specimen. It is presently semi-hemispherical, measuring 30 mm in greatest length, 16 mm in

greatest width, 12 mm in greatest depth and weighing 3.5 g. The amber is golden in color with a red tinge on one surface.

The piece of amber originated from mines located in the Cordillera Septentrional mountain ranges in the northern Dominican Republic. An analysis of amber from seven Dominican mines by nuclear magnetic resonance spectroscopy suggests that amber from that area ranges in age from 25 to 40 million years (Lambert et al. 1985).

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(Figs. 1–3)

Type.—Holotype male, data: DOMINICAN REPUBLIC. Cordillera Septentrional mountains; deposited in the Museum of Dominican Amber, Puerto Plata, Dominican Republic.

Description.—*Male.* Integument black; pubescence sparse, mostly pale, erect or semierect; length about 8 mm. Head black, rounded, sparse pale pubescence throughout; head slightly narrower than thorax. Eyes and ocelli normal; eyes large, not bulging; ocelli small; ocello-ocular distance about $4.0 \times$ greatest width of ocelli. Relatively large, well-separated punctures throughout. Mandibles bidentate, black throughout. Clypeus bidentate (but cannot be seen clearly). Antennae black; flagellomeres subequal in length; scape bicarinate beneath, coarsely punctate; antennal scrobes not carinate (but not clearly visible). Thorax black, longer than broad, predominantly with sparse pale pubescence, with moderately large, well-separated punctures. Pronotum with humeral angles rounded; anterior margin apparently not emarginate (consistent with evenly rounded posterior margin of head). Mesonotum without laterally expanded lobes. Propodeum coarsely reticulate. Tegulae subhemispherical, with moderately large punctures; anterior margin with black pubescence. Pleura coarsely punctate throughout. Prothorax, scutellum, propodeum, and pleura with sparse pale pubescence; mesothorax with black pubescence. Legs black, with sparse pale pubescence; calcaria pale; apices of middle and hind femora rounded; posterior trochanters normal, not toothed; hind tibiae cylindrical, not flattened on inner margin. Wings (badly damaged, clipped off near base) with basal third (right wing) hyaline, dark veins. Abdomen black throughout. Terga and sterna I and II with coarse punctures; apical one-half of remaining segments with smaller, shallower punctures. Tergite I with sparse, pale pubescence; conspicuously lacking an apical fringe of hairs. Sternite I with a longitudinal carina about nine-tenths the length of the segment. Tergite II with anterior two-thirds having sparse, pale pubescence; posterior third with sparse, black pubescence; apical fringe pale. Terga III and IV with sparse, pale pubescence with pale apical fringes of hairs. Terga V and VI with black pubescence throughout, including apical fringes. Felt lines with black pubescence. Sterna I–IV with sparse, pale pubescence; II–IV with apical fringes of pale hairs. Sterna V–VI with black pubescence. Sternite II with a round, median pit filled with hairs (Fig. 3). Pygidium not readily visible, but appears to have an apical fringe of hairs. Hypopygium black, punctation not readily visible; posterolateral angles of last sternite appear to be rounded, not dentate.

Diagnosis.—*Dasymutilla dominica* is placed in the *bioculata* species group. It is easily distinguished from other, closely related members of the *bioculata* species-group by the color of the second abdominal segment. In *D. dominica*, the integument of the second abdominal segment is entirely black. In *D. bioculata* (Cresson), the apical one-half of the second abdominal tergite is ferruginous. *Dasymutilla chiron* (Blake) has a pair of large yellow spots on the posterior one-half of the tergite. In *D. hersilia* Mickel, the second sternite is entirely, and the anterior, posterior, and lateral margins of the second tergite are black, although the remainder is ferruginous; additionally, the integument of the second abdominal segment is entirely ferruginous for *D. lepeletierii* (Fox), *D. pyrrhus* (Fox), and *D. praegrans* Mickel.

Etymology.—The specific name is a Latinized version of the name of the republic from which the specimen was collected.

Distribution.—Known only from the type specimen.

Material Examined.—Type.

DISCUSSION

The genus *Dasymutilla* was first proposed by Ashmead (1899). The characters that he attributed to the genus included the first abdominal segment being petiolate with the second; rounded or hemispherical, highly polished eyes; males with wings; and the body usually very hairy or pubescent. Inconsistencies in Ashmead's classification were pointed out by subsequent authors. Mickel's (1928) list of diagnostic characters for the group has been generally accepted since its publication. Although his characters included many of the same as Ashmead's, Mickel noted that not all *Dasymutilla* are densely pubescent. Except for characters of the wings (which cannot be seen), the type of *D. dominica* exhibits the characteristics attributed to *Dasymutilla*. The median pit filled with hairs on the second abdominal sternite is an important character, but one that is present only in some male *Dasymutilla*. However, the only other genus in which this character is present is *Traumatomutilla*, and that genus is restricted in distribution to South America. Thus, it seems apparent that, despite its age, this specimen belongs to *Dasymutilla*.

Mickel (1928) points out that many of the characters present in *Dasymutilla* are superspecific; that is, present in more than one species. He uses the term "species group," with members of each group being closely related. Using Mickel's (1928) key to the species, *D. dominica* keys to couplet 54, with species in couplets 54-56 belonging to the *bioculata* species-group. Characters shared by males of this group include the presence of a median pit filled with hairs on the second abdominal sternite, the presence of an apical fringe of hairs on the last tergite, the absence of a prominent tooth on the posterior trochanters, normal size ocelli and eyes, cylindrical posterior tibiae, and rounded apices on the middle and hind femora.

The subfamily Sphaerophthalminae, which contains two tribes, is cosmopolitan in distribution. The tribe Dasylabrini is found primarily in the Old World, and the tribe Sphaerophthalmini occurs primarily in the New World. The New World distribution of the Sphaerophthalmini may have resulted from a single introduction of an ancestral sphaerophthalmine from Africa into South America at about the time that these two continents split apart about 110 million years ago (Brothers 1975). After becoming established in South America, the tribe apparently radiated extensively and rapidly, establishing two basic lines, or subtribes, the Pseudome-thocina and Sphaerophthalmina (to which *Dasymutilla* belongs).

The origin of *Dasymutilla* is not known. However, based upon its present distribution, it may have radiated from an ancestral Sphaerophthalmina in the Central American region after the two continents were reunited during the Cretaceous period (Dietz & Holden 1970), with its distribution being mostly northward into North America. There are at least three extant species of *Dasymutilla* that are found in the Dominican Republic. At least one other species is found in Cuba. There is very little known about how the Caribbean region was formed. However, the land forms presently in the Caribbean, including the Dominican



Figures 1–3. Holotype of *Dasymutilla dominica* Manley & Poinar. Figure 1. Dorsal view. Figure 2. Lateral view. Figure 3. Ventral view of abdomen showing median pit filled with hairs on second sternite (arrow).



Republic, may have separated from the Central American region after the evolution of *Dasymutilla* and prior to their moving to their present location about 120 to 70 million years ago (LePichon 1968). *Dasymutilla* is the most widely distributed and highly radiated (with about 150 species) group of mutillids in North America (at least of the diurnal mutillids). The new *Dasymutilla* we describe here is a relatively highly derived species, because of the pit on the second abdominal sternite. Thus, it seems likely that the genus radiated from a more primitive *Sphaerophthalmina* well over 40 million years ago.

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